

REMARKS

Claims 15, 27-28 and 42 have been canceled, Claims 1-2, 18, 23-24, 29, 31-33, 39 and 45 have been amended, and Claims 54-57 have been added. Claims 1-14, 16-26, 29-41 and 43-57 are pending in the application. This Amendment is accompanied by a Petition for a one-month time extension, and the required extension fee. Applicants have previously paid filing fees in an amount sufficient to cover all of the claims that are now pending, and thus no additional filing fee is due in association with the submission of this Amendment. In view of the foregoing amendments, and the remarks that follow, Applicants respectfully request reconsideration.

Comment Regarding Power of Attorney

The Power of Attorney for this application does not happen to identify the undersigned attorney. Consequently, in filing this Amendment, the undersigned is acting under the provisions of 37 C.F.R. §1.34.

Allowable Subject Matter

Noted with appreciation is the indication in the Office Action that Claims 7, 10, 13, 16, 18-26, 41 and 49 recite allowable subject matter, and would be allowed if rewritten in independent form. These claims each depend from other claims that are also believed to be allowable, for reasons discussed below. Accordingly, it is believed to be unnecessary at this time to separately place allowable Claims 7, 10, 13, 16, 18-26, 41 and 49 in independent form.

Comment on Statement of Reasons for Allowance

In Section 16 on pages 12-14 of the Office Action, the Examiner offers a statement of reasons why Claims 7, 10, 13, 16, 18-26, 41 and 49 are considered to recite allowable subject matter. Applicants agree that Claims 7, 10, 13, 16, 18-26, 41 and 49 recite allowable subject matter. However, Applicants do not agree in all respects with the stated reasons for allowance. For example, the stated reasons should not be interpreted to mean that they are the only reasons

supporting the allowability of these claims, and that there are no other reasons that separately and independently support the allowability of these claims.

Independent Claim 1

Independent Claim 1 stands rejected under 35 U.S.C. §102 as anticipated by Franzen U.S. Patent No. 5,763,878. However, Applicants were very well aware of Franzen before they filed the present application (as evident from the fact that Franzen is mentioned on page 14 of the specification). Claim 1 has been amended in order to more clearly specify the differences between the recited subject matter and Franzen. Applicants respectfully submit that Claim 1 is not anticipated under §102 by Franzen. In this regard, the PTO specifies in MPEP §2131 that, in order for a reference to anticipate a claim under §102, the reference must teach each and every element recited in the claim. Claim 1 of the present application includes limitations reciting:

operating the ion source to generate ions having a relatively
broad range of m/z values;
introducing the ions generated by the ion source into the ion
trap; . . .
ejecting ions from the ion trap within a relatively narrow
range of m/z values substantially orthogonally with respect to the
direction of elongation of the electrodes while retaining other ions
in the ion trap for subsequent analysis and/or fragmentation, such
that the ejected ions travel to the collision cell; . . .

In contrast, Franzen does not teach or suggest the mass selective ejection that is recited in these limitations from Claim 1, including operating the ion source to generate ions within a relatively broad range of m/z values, and then ejecting from the ion trap only ions having a relatively narrow range of m/z values. Franzen thus does not disclose each and every element recited in

Claim 1, and therefore does not anticipate Claim 1 under §102. Consequently, Claim 1 is believed to be allowable over Franzen, notice to that effect is respectfully requested.

Independent Claim 39

Independent Claim 39 stands rejected under 35 U.S.C. §102 as anticipated by the Franzen patent. However, Claim 39 has been amended to more clearly specify the differences between the recited subject matter and Franzen. Applicants respectfully submit that Claim 39 is not anticipated under §102 by Franzen. As noted above, the PTO specifies in MPEP §2131 that, in order for a reference to anticipate a claim under §102, the reference must teach each and every element recited in the claim. Claim 39 of the present application includes limitations reciting an ion source, and an ion trap with:

... elongate electrodes operable to provide a trapping field to trap ions introduced from the ion source with a relatively broad range of m/z values and to eject trapped ions over a relatively narrow range of m/z values such that the ions are ejected from the ion trap substantially orthogonally to the direction of elongation of the electrodes; ...

In contrast, Franzen does not teach or suggest the mass selective ejection that is recited in these limitations from Claim 39, including trapping ions introduced from an ion source with a relatively broad range of m/z values, and then ejecting trapped ions over a relatively narrow range of m/z values. Franzen thus does not disclose each and every element recited in Claim 39, and therefore does not anticipate Claim 39 under §102. Consequently, Claim 39 is believed to be allowable over Franzen, notice to that effect is respectfully requested.

Independent Claim 34

Independent Claim 34 stands rejected under 35 U.S.C. §103 on the ground that it would be obvious in view of a proposed combination of teachings from the Franzen patent and Reinhold U.S. Patent No. 6,483,109. This ground of rejection is respectfully traversed, for the following reasons. Claim 34 includes limitations that recite:

operating the ion source to generate ions, . . .

operating the first trapping region to trap a primary set of precursor ions introduced from the ion source, the primary set of precursor ions having a relatively large range of m/z values; . . .

operating the first trapping region to eject a first secondary subset of the primary set of precursor ions, the first secondary set of precursor ions having an intermediate range of m/z values, thereby to travel to the second trapping region while retaining other ions from the primary set of precursor ions in the first trapping region,

operating the second trapping region to trap ions from the first secondary subset of precursor ions introduced from the first trapping region, . . .

performing a plurality of fragmentation/analysis stages of trapped ions from the first secondary subset of precursor ions; . . .

operating the first trapping region to eject a second secondary subset of the primary set of the precursor ions, the second secondary subset of precursor ions having a different intermediate range of m/z values, thereby to travel to the second trapping region,

operating the second trapping region to trap ions from the second secondary subset of precursor ions introduced from the first trapping region, . . .

performing a plurality of fragmentation/analysis stages of trapped ions from the second secondary subset of precursor ions;

wherein each of the respective plurality of fragmentation/analysis stages comprises

operating the second trapping region to eject a tertiary subset of precursor ions with a relatively narrow range of m/z values substantially orthogonally with respect to the direction of elongation of the electrodes . . .

The PTO specifies in MPEP §2142 that:

The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness.

Applicants respectfully submit that Franzen and Reinhold fail to establish a *prima facie* case of obviousness under §103 with respect to Claim 34, for the following reasons. MPEP §2142 specifies that:

To establish a *prima facie* case of obviousness, . . . there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference

teachings. . . . The teaching or suggestion to make the claimed combination . . . must both be found in the prior art, and not based on applicant's disclosure.

With respect to this required motivation, MPEP §2142 also specifies that:

To reach a proper determination under §103, the examiner must step backward in time and into the shoes worn by the hypothetical "person of ordinary skill in the art" when the invention was unknown and just before it was made. . . . Knowledge of applicant's disclosure must be put aside in reaching this determination, . . . impermissible hindsight must be avoided, and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.

In addition, the MPEP provides at § 2143.01 that:

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. . . . Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so". (Emphasis in original).

Applicants respectfully submit that there is no suggestion or motivation combine Franzen and Reinhold to produce a trap/time-of-flight (TOF) mass spectrometer wherein the ions are mass-selectively ejected from the trap in the orthogonal dimension. While Franzen and Reinhold each

disclose a trap/TOF mass spectrometer, they focus on entirely distinct problems. Franzen is focused on delivering an ion pulse to the TOF that minimizes mass selectivity and energy spread, whereas Reinhold is focused on performing MSⁿ analysis in an ion trap without loss of the non-isolated species. There is certainly nothing that would motivate a person of ordinary skill to modify Franzen to provide mass selective ejection, much less by modifying Franzen to utilize a multistage fragmentation arrangement from Reinhold. In the words of MPEP §2143.01, "[t]he mere fact that [the Franzen and Reinhold] references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination". Keeping in mind the very different problems that Franzen and Reinhold were each attempting to solve, there is nothing in either of these two references that would suggest or motivate the particular modification of Franzen that is proposed by the Office Action.

Applicants respectfully submit that the Examiner is using Applicants' disclosure as a blueprint for selectively extracting isolated teachings from each of Franzen and Reinhold, and then combining them with a view to the desired result. But this is hindsight reconstruction of Applicants' invention, whereas the passage quoted above from MPEP §2142 emphasizes that "[k]nowledge of applicant's disclosure must be put aside . . . , . . . impermissible hindsight must be avoided, and the legal conclusion must be reached on the basis of the facts gleaned from the prior art". In effect, the Office Action is asserting that the proposed modification of Franzen to meet Claim 34 would have been well within the ordinary skill of the art, or in other words that the level of ordinary skill in the art effectively provides the suggestion to make the proposed modification. However, this approach is directly prohibited by the provisions of MPEP §2143.01, which state that:

FACT THAT THE CLAIMED INVENTION IS WITHIN THE
CAPABILITIES OF ONE OF ORDINARY SKILL IN THE ART
IS NOT SUFFICIENT BY ITSELF TO ESTABLISH *PRIMA*
FACIE OBVIOUSNESS

A statement that modifications of the prior art to meet the claimed invention would have been " 'well within the ordinary skill of the art at the time the claimed invention was made' " because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. [Case citations omitted] . . . (The level of skill in the art cannot be relied upon to provide the suggestion to combine references).

Thus, the approach taken in the Office Action is an approach that is directly prohibited by the provisions of MPEP §2143.01. The present §103 rejection of Claim 34 is therefore incomplete, because it fails to demonstrate the motivation that is required by the MPEP. The §103 rejection is based primarily on hindsight of the present invention, rather than on motivation properly derived from what was known prior to the present invention. Accordingly, it is respectfully submitted that Claim 34 is not rendered obvious under §103 by Franzen and Reinhold. Claim 34 is thus believed to be allowable, and notice to that effect is respectfully requested.

Independent Claim 45

Independent Claim 45 stands rejected under 35 U.S.C. §103 on the ground that it would be obvious in view of a proposed combination of teachings from Franzen and Reinhold. This ground of rejection is respectfully traversed, for the following reasons. Claim 45 includes limitations that recite an ion trap having:

. . . first and second ion storage volumes . . . , the first ion storage volume further comprising one or more electrodes operable to eject

trapped ions within an intermediate m/z range axially along the ion path into the second ion storage volume, . . . [and] the second ion storage volume further comprising a plurality of elongate electrodes operable to eject trapped ions within a relatively narrow m/z range from the second ion storage volume substantially orthogonally to the direction of elongation through an exit aperture.

The rationale offered in the Office Action for the rejection of Claim 45 is precisely the same rationale offered for the rejection of Claim 34. For the same basic reasons discussed above in association with Claim 34, it is respectfully submitted that there is no suggestion or motivation to combine Franzen and Reinhold so as to yield a mass spectrometer where ions are mass-selectively ejected from a trap in an orthogonal dimension, much less by modifying Franzen to utilize a multistage fragmentation arrangement from Reinhold. It is respectfully submitted that the §103 rejection of Claim 45 is incomplete, because it fails to demonstrate the motivation that is required by the MPEP. The §103 rejection is based primarily on hindsight of the present invention, rather than on motivation properly derived from what was known prior to the present invention. Accordingly, it is respectfully submitted that Claim 45 is not rendered obvious under §103 by Franzen and Reinhold. Claim 45 is thus believed to be allowable, and notice to that effect is respectfully requested.


Dependent Claims

Claims 2-6, 8-9, 11-12, 14, 17, 29-33 and 54-57, Claims 35-38, Claims 40 and 43-44, and Claims 46-48 and 50-53 respectively depend from Claim 1, Claim 34, Claim 39 and Claim 45, and are also believed to be distinct from the art of record, for example for the same reasons discussed above with respect to Claims 1, 34, 39 and 45, respectively.

Conclusion

Based on the foregoing, it is respectfully submitted that all of the pending claims are fully allowable, and favorable reconsideration of this application is therefore respectfully requested. If the Examiner believes that examination of the present application may be advanced in any way by a telephone conference, the Examiner is invited to telephone the undersigned attorney at 972-739-8647.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "T. Murray Smith", with a checkmark to the left.

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Date: February 13, 2006

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R-125484.1